Cairo University

Faculty of Engineering

Systems and Biomedical Engineering

Clinical Decision Support System

Task 1

Submitted to:

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1. **Chosen dataset:**

- Hypothyroid. The goal is to determine whether a patient has compensated, primary or secondary hypothyroid.
- 30 attributes, 29 independent and one dependent. They include age, sex, sick, pregnant, tumor and some hormones.

2. **Accuracy:**

- 96.85% correctly classified.
- MCC (Matthew's Correlation coefficient) with average of 0.8.

3. **Problems:**

- When tried to build a model with single independent attribute the results were with great errors. We found that our model performed better using all the independent attributes.

4. **Results Summary:**

```
=== Summary ===

Correctly Classified Instances        3653               96.8452 %
Incorrectly Classified Instances       119                3.1548 %
Kappa statistic                          0.7604
Mean absolute error                      0.0256
Root mean squared error                  0.112
Relative absolute error                 35.0862 %
Root relative squared error             58.7932 %
Total Number of Instances             3772

=== Detailed Accuracy By Class ===

                 TP Rate  FP Rate  Precision  Recall   F-Measure  MCC      ROC Area  PRC Area  Class
                 0.994    0.275    0.977      0.994    0.985      0.797    0.980     0.997     negative
                 0.608    0.005    0.861      0.608    0.713      0.712    0.983     0.809     compensated_hypothyroid
                 0.800    0.003    0.864      0.800    0.831      0.827    0.971     0.797     primary_hypothyroid
                 0.000    0.002    0.000      0.000    0.000      -0.001   0.760     0.021     secondary_hypothyroid
Weighted Avg.    0.968    0.254    0.968      0.968    0.967      0.793    0.979     0.981

=== Confusion Matrix ===

    a    b    c    d   <-- classified as
 3459    6    9    7 |    a = negative
   74  118    2    0 |    b = compensated_hypothyroid
    5   13   76    1 |    c = primary_hypothyroid
    1    0    1    0 |    d = secondary_hypothyroid
```